Notice of Allowability	Application No. 09/763,971	Applicant(s) HAMADA ET AL.	
	Examiner Eric Keasel	Art Unit 3754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *RCE and amendment filed July 21, 2004*.

2. ☒ The allowed claim(s) is/are *16-21*.

3. ☒ The drawings filed on *28 February 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 20031121
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 21, 2004 has been entered.

Information Disclosure Statement

2. The IDS, filed Nov 21, 2003 contains two references that are already of record. The examiner has lined through these references.

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Lawrence Carter on August 17, 2004.

The application has been amended to clarify that the cylindrical yoke in claim 18 refers to the yoke that was amended into the last line in claim 16 by the amendment of July 21, 2004. Also, claim 16 has been amended so that the "K" for Kelvin is capitalized in "W/mK". A complete listing of all claims in the application follows:

1-15 (canceled)

16. (currently amended) A fuel injector having a valve driven by electromagnetic force, which injects fuel directly into a cylinder of an internal combustion engine, comprising:

a first coil in which a large excitation current flows for a short time during a beginning of a valve opening operation so as to substantially secure magnetomotive force necessary to open said valve;

a second coil in which a relatively small excitation current flows so as to substantially secure magnetomotive force to hold the valve in an open state after said valve is opened; and

a bobbin on which said first and second coils are wound;

wherein said bobbin with said first and second coils is formed by a resin molding material having a heat conductivity between 1.0 - 3.0 ~~W/mk~~ W/mK, and

wherein said first and second coils are arranged on an axial direction of said bobbin, a flange for partitioning between said first coil and said second coil is provided at the bobbin, and said flange extends to the inner surface of a yoke housing the first and second coils.

17. (previously presented) The fuel injector according to claim 16, wherein said bobbin is formed by a synthetic resin containing a filler having good heat conductivity.

18. (currently amended) The fuel injector according to claim 16, further comprising a stationary core arranged at a center of a main body of the fuel injector, said first and second coils arranged at the outside of said stationary core through said bobbin;

wherein said yoke is a cylindrical yoke arranged at the outside of said first and second coils;

wherein said bobbin is formed by a synthetic resin containing a filler having good heat conductivity, and wherein heat of said first and second coils is conducted to said core and said yoke through said bobbin, and further an air gap is formed between the outside surface in said coil and an inner circumference of said yoke.

19. (previously presented) The fuel injector according to claim 16, wherein said bobbin is formed of polyphenylene sulfide containing iron oxide and/or alumina as a filler.

20. (previously presented) The fuel injector according to claim 16, wherein said bobbin is constituted by iron oxide and/or alumina in 30 - 80 weight %, and further by polyphenylene sulfide and glass fiber.

21. (previously presented) The fuel injector according to claim 16, wherein said fuel injector is a battery-type injector driven by supplying a battery voltage to said first and second coils directly.

4. The following is an examiner's statement of reasons for allowance:

Although fuel injector valves with a first (large excitation current) coil for opening the valve and a second (lesser excitation current) coil for securing the valve in the open position are known in the art (e.g. Yamakado et al., US Patent Number 5,992,391), the prior art of record does not disclose or suggest the first and second coils being arranged on an axial direction of a bobbin, with a flange partitioning the first and second coils being provided at the bobbin, with the flange extending to the inner surface of a yoke housing the first and second coils, and with the bobbin being formed by a resin molding material having a heat conductivity between 1.0 - 3.0 W/mK, in combination with other limitations set forth in claim 16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Keasel whose telephone number is (703) 308-6260. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Mancene can be reached on (703) 308-2696. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Keasel 17AUG2004

Eric Keasel
Patent Examiner
Art Unit 3754